

Patent Claims:

1. Encapsulated power semiconductor assembly with:

- a substrate of a ceramic insulation material with at least one island (14, 17, 18, 19) consisting of a thermally and electrically conductive material,
- at least two power semiconductor chips (22) arranged on the islands,
- electrical connections (20, 24, 26, 28, 14) from the chips to connecting elements (10, 12), wherein at least two connecting elements are electrically connected to the islands,

characterised in that

an enclosure (30) of pressed plastic material is provided which fully surrounds the power semiconductor chips (22) and at least partially surrounds the substrate, wherein the connecting elements (10, 12) are designed as flat conductor connections projecting from the enclosure, and in that the substrate exhibits a metal coating (32) on the side opposite the islands.

2. Power semiconductor assembly according to claim 1, characterised in that the islands (14, 17, 18, 19) include separate partial surfaces of a metal layer.
3. Power semiconductor assembly according to claim 1 or 2, characterised in that the substrate is a ceramic substrate which contains, in particular, aluminium oxide or aluminium nitride ceramic material.
4. Power semiconductor assembly according to one of claims 1 to 3, characterised in that the metal coating (32) of the substrate is at least partially exposed on the side opposite the islands.
5. Power semiconductor assembly according to one of claims 1 to 4, characterised in that the substrate is a direct-copper-bond or direct-aluminium-bond substrate.

6. Power semiconductor assembly according to one of claims 1 to 5, characterised in that the electrical connections comprise soldered connections.
7. Power semiconductor assembly according to one of claims 1 to 6, characterised in that the electrical connections comprise wire connections (20, 24, 26, 28) and/or connections (14) via the islands.
8. Power semiconductor assembly according to one of the preceding claims, characterised in that connecting elements (10, 12) are located on two different sides of the enclosure.
9. Power semiconductor assembly according to one of the preceding claims, characterised in that the connecting elements (10, 12) are arranged and connected to the chips so that connecting elements conducting a main current are arranged adjacent to each other.
10. Power semiconductor assembly according to one of the preceding claims, characterised in that the connecting elements (10, 12) are arranged and connected to the chips so that two connecting elements, which are provided with potentials which have a high mutual potential difference, are arranged further from each other than two connecting elements with potentials which have a low mutual potential difference.
11. Power semiconductor assembly according to one of the preceding claims, characterised in that the chips (22) are secured to a metal island by means of soldered connections.
12. Power semiconductor assembly according to one of the preceding claims, characterised in that at least one shoulder (37) is formed on the bottom of the enclosure (30) for inserting a flat insulator.
13. Power semiconductor assembly according to one of the preceding claims, characterised in that the chips comprise MOSFET, diode, IGBT and/or thyristor chips.

14. Power semiconductor assembly according to one of the preceding claims, characterised in that the chips, when interacting, form an individual switch, a chopper, a bridge branch, an H-bridge or a threephase bridge (Fig. 4) or a combination of these elements.